

WHAT IS CLAIMED IS:

1. A microsize driving device which comprises:

(a) a substrate having a linear track groove;

(b) an arrangement of motor protein molecules deposited on the bottom of the linear track groove; and

(c) track proteins disposed on the arrangement of the motor protein molecules,

the linear track groove having side surfaces shaped in a moving direction controlling structure which permits a linear movement of the track proteins moving in a specific direction but inhibits the track proteins moving in a direction reverse to the said specific direction to cause reversion for the movement in the said specific direction.

2. The microsize driving device as described in claim 1 in which the moving direction controlling structure is a patterned structure of which, in a part of the side surfaces of the linear track groove, the track has a width narrowing toward the specific direction and broadening toward the reversed direction.

3. The microsize driving device as described in claim 2 in which the linear track groove is provided in the intermediate position with a part of which one end has a width broader than the lengthwise length of the track protein and the other end has a width narrower than the same.

4. The microsize driving device as described in claim 1 in which the moving direction controlling structure of the linear track groove has a forward portion and a rearward portion which are not on a single straight line.

5. The microsize driving device as described in claim 1

in which the bottom of the linear track groove is formed from silicate glass or polystyrene.

6. The microsize driving device as described in claim 1 in which the linear track groove has a side wall made from a melamine-based resin or a (meth)acrylic acid-based resin.

7. The microsize driving device as described in claim 1 in which the motor protein is kinesin or myosin.

8. The microsize driving device as described in claim 1 in which the track protein is microtubule or actin.

9. The microsize driving device as described in claim 1 in which the linear track groove has a ring-formed pattern.

10. A method for the preparation of a microsize driving device which comprises the steps of:

(A) forming a linear track pattern by providing a photoresist layer on a substrate, which is light-exposed through a photomask followed by development;

(B) forming a linear track groove by removing the photoresist layer remaining on the light-exposed areas of the substrate by a plasma treatment or sputtering;

(C) forming an arrangement of molecules by pouring a solution containing a motor protein into the linear track groove to deposit molecules of the motor protein onto the bottom thereof; and

(D) disposing molecules of a track protein on the molecular arrangement.